

Appl. No. 10/666,493  
Reply to Non-Final Official Action of November 3, 2006

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**REMARKS**

Claims 1-19 and 29 were indicated as previously pending in this application though Claims 10 and 18 had previously been cancelled.

As requested by Examiner MacArthur, a Courtesy Copy of the Amendment filed April 21, 2006 and entered by virtue of the RCE filed May 8, 2006, is attached hereto. Claims 10 and 18 were cancelled in said Amendment and claim amendments were made.

Claims "1-19 and 29" were listed as being rejected in the subject Office action. Claims 11 and 14 are hereby amended and claim 19 cancelled in this paper. Reconsideration of this application is respectfully requested.

Applicants take this opportunity to thank Examiner Sylvia MacArthur for the opportunity given their undersigned counsel to discuss the subject Office Action in a telephonic Examiner Interview that took place on January 31, 2007.

Applicants respectfully request re-examination, reconsideration and allowance of each of pending Claims 1-9, 11-17 and 29.

**Claim rejections under 35 U.S.C. §102(b)**

The Action rejects Claims 12, 13 and 29 under 35 U.S.C. §102(b) for allegedly being anticipated by U.S. Patent No. 6,228,211 to Jeong ("Jeong"). Claims 12 and 29 each recite that one of said slats substantially covers said drain opening. On Page 3, Line 3 of this Action, the Examiner expressly admits that Jeong fails to specify that one of the slats covers the drain opening. Accordingly, Claims 12 and 29 are not anticipated by Jeong and withdrawal of the rejections to Claims 12 and 29 are respectfully requested.

Claim 13 depends from Claim 12 and is also not anticipated by Jeong. Withdrawal of the rejection of Claim 13 is respectfully requested.

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**Claim rejections under 35 U.S.C. §103(a)**

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The Action rejects Claims 1-3, 5, 7, 10, 16 and 18 under 35 U.S.C. §103(a) for allegedly being obvious over Jeong in view of U.S. Patent No. 5,845,660 to Shindo et al. ("Shindo"), and in view of the Examiner's comments. Applicants point out that Claims 10 and 18 were previously cancelled.

The Action contends that it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the wafer manufacturing apparatus of Jeong with the regulating means of Shindo and also alleges that it is well settled that the determination of optimum values of the size of the slats is a matter of optimization. Reconsideration and withdrawal of the rejection of these claims are respectfully requested in view of following arguments.

Claim 1 recites that one of said slats substantially covers said drain opening. As conceded by the Action, Jeong fails to teach or suggest this claimed feature. The claimed feature of one of the slats substantially covering the drain opening provides the advantage that adjacent substrates do not stick to each other when liquid in the tank is drained through the drain opening.

M.P.E.P. 2143 provides that:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (Emphasis added).

Applicants submit that one of ordinary skill in the art would have so such motivation. In particular, one of ordinary skill in the art and in possession of the Jeong disclosure would not have been motivated by Shindo to modify Jeong's apparatus, in particular to add regulating means 25 of Shindo, for the following reasons.

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Jeong discloses an apparatus for etching a **single glass substrate**. (Col. 2, Lines 52-53) which rests horizontally in the etch chamber. In order to **uniformly etch substrate 11**, Jeong uses **bubbling plate 3**, which the Examiner compares to the regulating means recited in Claim 1. Bubbling plate 3 creates bubbles and introduces nitrogen gas bubbles INTO the etching chamber after passing through holes 28 of air tubes 22. (Col. 3, Lines 59-64). Clearly, Jeong's apparatus is provided to uniformly etch a **single substrate 11** and Jeong provides no teaching that the bubbling plate is directed to controlling or modifying LIQUID flow OUT of the etch chamber, i.e., into a drain. Moreover, since **only one substrate 11** is disposed within container 1 for etching, **no sticking of two substrates** could occur due to turbulence while draining. Accordingly, Jeong fails to consider or address, either expressly or impliedly, the sticking problem that is raised when LIQUID is quickly drained through a drain opening and one of ordinary skill and in possession of the Jeong teaching would have no motivation to modify Jeong to alter how LIQUID flow OUT of the etch chamber is controlled.

Shindo teaches a substrate washing and drying apparatus for **increasing throughput and preventing particles** from adhering on a substrate. (Summary of the Invention). Shindo discloses a plurality of vertically disposed substrates. Shindo merely discloses rectifying means 25 comprising porous plate 25a and diffusion plate 25b, which are disposed over supply/discharge port 24. Nothing in Shindo's description or drawings addresses the substrate sticking issue that is solved by the apparatus of Claim 1.

As set forth above, Jeong's bubbling plate 3 provides nitrogen gas to the etch solution for uniformly etching the single substrate. The Action states on page 3 "it would have been obvious . . . to provide the wafer manufacturing apparatus of Jeong with the regulating means of Shindo" and "modify the apparatus of Jeong with the regulating means of Shindo".

A) If the Action suggests REPLACING Jeong's bubbling plate 3 with Shindo's rectifying means 25 (either porous plate 25 or diffusion plate 25b, which is a solid plate **without any tubes disposed therein to deliver gas**), Jeong's purpose of delivering bubbles to uniformly etch a substrate could not be achieved. Accordingly, one of ordinary skill in the art would not have been motivated to replace Jeong's apparatus with Shindo's regulating means to dispose one of slats substantially covering the draining opening.

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B] One would also not be motivated to modify Jeong's bubbling plate 3 by ADDING Shindo's regulating means 25 either above or below Jeong's bubbling plate. As above, Jeong does not *teach* regulating downward liquid flow and since Jeong discloses a single wafer etching chamber in which the single wafer lies horizontally, Jeong apparently does not even consider, regulating downward liquid flow. There would be no motivation to modify Jeong to ADD Shindo's regulating means 25.

Accordingly, one of ordinary skill in the art would not have been motivated to modify Jeong's apparatus in view of Shindo to arrive at the claimed invention with one of slats substantially covering the draining opening. Claim 1 is not obvious over the combined teachings of Jeong and Shindo. Withdrawal of the rejection to Claim 1 is respectfully requested and Claim 1 is therefore allowable.

Claims 2, 3, 5 and 7 depend from Claim 1 and are therefore also not obvious over Jeong and Shindo. Withdrawal of the rejections to these claims is respectfully requested and Claims 1-3, 5, and 7 are therefore allowable.

Independent Claims 12 and 29 also recite that one of said slats substantially covers the drain opening and are therefore distinguished from Jeong. Since Shindo does not make up for the deficiencies of Jeong, Claims 12 and 29 are therefore distinguished from Jeong and Shindo and allowable for at least the reasons set forth in connection with Claim 1. Claim 16 depends from Claim 12 and is therefore distinguished from Jeong and Shindo and therefore allowable via virtue of their dependency. Withdrawal of the rejection of Claim 16 is requested. Claim 13 also depends from Claim 12 and is distinguished from Jeong and Shindo and therefore allowable via virtue of dependency.

The Action rejects Claims 9 and 11 under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Shindo, and further in view of U.S. Patent No. US 6,615,774 to Sonoda et al. ("Sonoda"). Claims 9 and 11 depend from Claim 1, which is distinguished from the combined teachings of Jeong and Shindo. Sonoda fails to cure the deficiency that there is no suggestion or motivation in Jeong or Shindo to modify Jeong's apparatus in view of Shindo and Sonoda does not provide a slat over the drain. Accordingly, Claims 9 and 11 are not obvious over Jeong,

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Shindo and Sonoda. Withdrawal of the rejections to the Claims 9 and 11 is respectfully requested.

The Action also rejects Claims 14, 16 and 19 under 35 U.S.C. §103(a) as being unpatentable over Jeong in view of Sonoda. Claim 19 has been cancelled. Claims 14 and 16 depend from Claim 12, which recites the feature that one of the slats substantially covers the drain opening. As conceded by the Action, Jeong fails to teach or suggest this claimed feature. Moreover, nothing in Sonoda's description or drawings shows that one of slats substantially covers a drain opening. Accordingly, Claims 14 and 16 are not obvious over the combined teachings of Jeong and Sonoda. Withdrawal of the rejections to Claims 14 and 16 is respectfully requested. Claims 14 and 16 are therefore allowable.

Moreover, claims 9 and 16 are further distinguished for reciting the feature that "said slats are oriented at an angle of between about 0° and about 45° with respect to the plane of said regulating plate" and Claims 11 and 16 are further distinguished for reciting the feature that "at least one of said slats is angled with respect to the plane of said regulating plate." The slats, part of the regulating means, are angled with respect to the regulating means itself. Sonoda is directed to a wafer cleaning device which comprises a cleaning tank whose bottom portion is formed substantially in a V-shape conforming to the bottom-face shape of the wafer, and is the tank bottom itself is inclined at an angle of 24 degrees relative to "a horizontal plane". In Sonoda, the "angled rods 24" proffered by the Examiner are of circular cross section and are not angled with respect to anything. Bottom portion 26 of the tank in Sonoda is not a regulating means as claimed (with slats, etc.). Sonoda therefore does not teach any slats angled with respect to the regulating means itself.

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**Claims 4, 8, 15, and 17**

The Action failed to state any ground for rejection or objection to Claims 4, 8, and 17. Indication of the allowability of Claims 4, 8, and 17 is thus requested.

Further, Claims 4, 8, and 17 depend from Claims 1 and 12 and are, therefore, allowable for at least the reasons set forth in connection with Claims 1 and 12, respectively.

The Action also fails to state any ground for rejection or objection to Claim 15. Indication of the allowability of Claim 15 is requested.

Claim 15 also depends from Claim 12 and is, therefore, allowable for at least the reasons described above.

In view of the foregoing arguments, withdrawal of the rejections of Claims 1-9, 11-17 and 29 are respectfully requested, as Applicants believe that each of Claims 1-9, 11-17 and 29 is allowable.

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**Conclusion**

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Early notification to that effect is respectfully requested.

The Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account 04-1679.

Respectfully submitted,

Dated: February 1, 2007

  
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Attachment: Amendment filed April 21, 2006

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